

### **Specification Amendments**

Please replace the paragraph on page 2, line 13 to page 3, line 13 as follows:

One such process fluid is a saturated vapor/liquid fluid mixture (e.g., steam). It would be advantageous to be able to measure the vapor quality of this fluid mixture. Vapor quality of a saturated vapor / liquid mixture is defined as ratio of the mass of the vapor phase to the total mass of the mixture. Saturated mixtures exist at temperatures and pressures at which liquid and vapor phases coexist. The temperatures and pressures at which the liquid and vapor phases coexist lie under the “vapor bubble” on a phase diagram. The collection of points known as the saturated liquid line and the collections of points known as the saturated vapor line define the vapor bubble. These two lines connect at, what is termed, the critical point. Saturated mixtures exist only under the vapor bubble. For pressures and temperatures outside of the vapor bubble, the fluid exists as a single phase and the properties of that fluid, such as density, enthalpy, internal energy, etc., are uniquely defined by the pressure and temperature. For common fluids, such as water, these properties are tabulated as functions of pressure and temperatures and are available through a variety of references, ~~including a website hosted by NIST (ref:~~ <http://webbook.nist.gov/chemistry/fluid/>).

Please replace the paragraph on page 15, lines 11-18 as follows:

One technique of determining the convection velocity of the vortical disturbances within the process flow 12 is by characterizing the convective ridge of the vortical disturbances using an array of unsteady ultrasonic sensors or other beam forming techniques, similar to that shown in U.S. Patent Application Serial No. 09/729,994, filed December 4, 2000, entitled “Method and Apparatus for Determining the Flow Velocity Within a Pipe”, now US 6,609,069, which is incorporated herein by reference. This technique of determining the convection velocity of the vortical disturbances will be described in greater detail hereinafter.

Please replace the paragraph on page 19, lines 17-31 as follows:

The apparatus 10 of the present invention may be configured and programmed to measure and process the detected unsteady pressures  $P_1(t) - P_N(t)$  created by acoustic waves propagating through the mixture to determine the SOS through the flow 12 in the pipe 14. One such apparatus 310 is shown in Fig. 16 that measures the speed of sound (SOS) of one-dimensional sound waves propagating through the mixture to determine the gas volume fraction of the mixture. It is known that sound propagates through various mediums at various speeds in such fields as SONAR and RADAR fields. The speed of sound propagating through the pipe and mixture 12 may be determined using a number of known techniques, such as those set forth in U.S. Patent Application Serial No. 09/344,094, entitled "Fluid Parameter Measurement in Pipes Using Acoustic Pressures", filed June 25, 1999, now US 6,354,147; U.S. Patent Application Serial No. 09/729,994, filed December 4, 2002, now US 6,609,069; U.S. Patent Application Serial No. 09/997,221, filed November 28, 2001, now US 6,587,798; and U.S. Patent Application Serial No. 10/007,749, entitled "Fluid Parameter Measurement in Pipes Using Acoustic Pressures", filed November 7, 2001, now US 6,732,575, each of which are incorporated herein by reference.

Please replace the paragraph on pages 29, line 23 to page 30, line 2 as follows:

The processor module 16 may be implemented using hardware, software, or a combination thereof. The scope of the invention is not intended to be limited to any particular implementation thereof. For example, a typical software implementation may include using a microprocessor architecture having a microprocessor, a random access memory (RAM), a read only memory (ROM), input/out devices and a control, address and databus for connecting the same. Embodiments are envisioned in which the processor module 16 is implemented in many different ways by a person skilled in the art. The scope of the invention is not intended to be limited to any particular implementation of the processor module 16. For example, U.S. patent application serial no. 09/344,094 filed June 25, 1999, entitled "Fluid Parameter Measurement in Pipes Using Acoustic net Pressure" (CC-0066A), now US 6,354,147, and U.S. patent application serial no. 09/344,093 filed June 25, 1999, (CC-0102A), entitled "Non-Intrusive Fiber Optic Pressure Sensor for Measuring Unsteady Pressures within a Pipe", now 6,450,037, disclose techniques for responding to one or more sensed signals, for providing a resulting signal containing information about the internal pressure changes in the pipe, both hereby incorporated by reference in their entirety.